DETAILED ACTION

This Office Action is in response to the Amendment filed 10 August 2011. Claims 1-3, 5-6, 29-31, 33-44 and 46-55 are currently pending. The Examiner acknowledges canceled claims 4, 7-28, 32 and 45 and new claim 55.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10 August 2011 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 55 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The Applicant states in the remarks filed 10 August 2011 that the support for new claim 55 is found within the UK Patent Application No. 2369797 referred to in the specification [0025]. The attempt to incorporate subject matter into this application by reference to UK Patent Application No. 2369797 is

ineffective because the root words "incorporate" and/or "reference" have been omitted, See 37 CFR 1.57(b)(1) and MPEP 608.01(p), I, A; the reference document is not clearly identified as required by 37 CFR 1.57(b)(2)). The incorporation by reference will not be effective until correction is made to comply with 37 CFR 1.57(b), (c), or (d). If the incorporated material is relied upon to meet any outstanding objection, rejection, or other requirement imposed by the Office, the correction must be made within any time period set by the Office for responding to the objection, rejection, or other requirement for the incorporation to be effective. Compliance will not be held in abeyance with respect to responding to the objection, rejection, or other requirement for the incorporation to be effective. In no case may the correction be made later than the close of prosecution as defined in 37 CFR 1.114(b), or abandonment of the application, whichever occurs earlier.

Any correction inserting material by amendment that was previously incorporated by reference must be accompanied by a statement that the material being inserted is the material incorporated by reference and the amendment contains no new matter. 37 CFR 1.57(f).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3, 5, 6, 29-31, 33-44 and 46-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Houston et al. (EP 1254645A1) in view of Sano et al. (US Patent No. 6,173,763).

6. Regarding claims **1, 37 and 54**, Houston et al. discloses an internal formation for a conduit, the formation having a helical-flow inducing means or a "longitudinally extending member" (12) adapted to extend along an inside surface of at least a portion of the length of the conduit, the longitudinally extending member having a first surface that is at least directed towards an inlet or the conduit and a second surface of the member is at least partially directed towards the outlet of the conduit, the first and second surfaces that are coupled together by a third surface or apex therebetween, the formation effects spiral flow of a fluid flowing through the conduit (column 1, lines 56-58, column 2, lines 10-12, 15-10, FIG 1). However, Houston et al. fails to disclose a 20º angle of the first surface subtending with a diameter of the conduit extending through a portion of the profile of the longitudinally extending member.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided a 20º angle of the first surface subtending with a diameter, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Houston et al. discloses helical ridging or a "longitudinally extending member" which may be of any cross-sectional shape and size [0009], however, Houston et al. fails to expressly disclose the longitudinally extending member having an asymmetric

profile in a direction transverse of the longitudinal axis of the member. It is well known that asymmetric profiles are used within tubes to provide certain flow characteristics. Houston et al. discloses a tube including a rectangular longitudinally extending member used to reduce or eliminate turbulence. Sano et al. also teaches a device formed of a tube that receives fluid flow therethrough and wherein the interior surface of the tube includes spiraled inner fins or a "longitudinally extending member" (7, 9) to control the flow resistances for different flow directions. The longitudinally extending member are asymmetrical wherein the rectangular member includes upward sloping sides (7d, 9d) and straight sides (7e, 93) that meet at an apex in a curved or convex configuration (column 3, lines 60-67, column 8, lines 55-63, Figs. 4, 10). Fluid flowing in the direction from A to B, encounter the sloped sides of the profile which produces smaller flow resistance as opposed to the fluid flowing from B to A which would cause a chaotic current (column 8, lines 65-67, column 9, lines 1-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied an upward sloped side to the longitudinally extending member of Houston et al., as taught by Sano et al., to reduce the flow resistance in the direction in which fluid is meant to flow through the device of Houston.

7. Regarding claim **2**, Houston et al. discloses a longitudinally extending member (12) that extends helically along the length of the conduit (column 2, lines 1-2 and 7-9, FIG. 1).

8. Regarding claim **3**, Houston et al. discloses a longitudinally extending member (12) extending helically along the internal side wall of the conduit.

9. Regarding claims **5 and 6**, Sano et al. discloses first and second surfaces of the longitudinal member having planar portions and/or a curved portions (9e, 9d) (FIG. 10).

10. Regarding claims **29 and 30**, Sano et al. discloses that if a second and or first surface includes a curved portion (9d), the curved portion being concave or convex, or a combination of concave and convex (FIG. 10).

11. Regarding claim **31**, the combination of Houston et al. and Sano et al. discloses all of the limitations previously discussed except for a first surface subtending with the diameter of the conduit extending through the portion of the profile of the longitudinally extending member at a smaller angle than the second surface. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided a smaller subtending angle of the first surface, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

12. Regarding claim **33**, the combination of Houston et al. and Sano et al. discloses all of the limitations previous discussed except for the first surface subtending the diameter of the conduit with an angle between 5º and 15º. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected a subtending angle having a value between 5° and 15°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

13. Regarding claim **34**, the combination of Houston et al. and Sano et al. discloses all of the limitations previous discussed except for an angle that the first surface subtends with the diameter of the conduit being substantially 10°. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected a subtending angle having a value of 10°, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

14. Regarding claim **35**, the combination of Houston et al. and Sano et al. discloses all of the limitations previous discussed except for a distance along the internal surface of the conduit from the diameter to the point at which the second surface meets the internal surface of the conduit to be substantially 25% of the internal width of the conduit. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have constructed the distance along the internal surface to the point at which the second surface meets the internal surface to be 25% of the internal width, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

15. Regarding claim **36**, Sano et al. discloses first and second surfaces that extend from the internal surface of the conduit towards each other and towards a central longitudinal axis of the conduit (FIG.10).

16. Regarding claim **38**, Sano et al. discloses an internal formation having a third surface formed of an apex coupling the first and second surfaces or a third surface that is curved due to the convex portion of the member (column 3, lines 60-67).

17. Regarding claim **39**, Sano et al. discloses an internal formation having a longitudinally extending member with asymmetric profile and extends along an inside surface of a conduit (Fig. 4).

18. Regarding claim **40**, Houston et al. discloses a conduit that is capable of being used for blood flow (column 7, lines 20-22, FIG. 1).

19. Regarding claim **41**, Houston et al. discloses a tube that is a vascular prosthesis (column 3, lines 12-14).

20. Regarding claim **42**, Houston et al. discloses a vascular prosthesis that is a graft (column 3, line 39-41).

21. Regarding claim **43**, Houston et al. discloses a vascular prosthesis that is a stent (column 3, lines 42-46).

22. Regarding claim **44**, Houston et al. discloses a vascular prosthesis that is a graft/stent combination (column 3, line 39-41).

23. Regarding claim **46**, Houston et al. discloses a fluid as being a liquid (column 4, lines 27-29).

24. Regarding claim **47**, Houston et al. discloses a conduit having two or more internal formations (FIG. 1).

25. Regarding claim **48**, Houston et al. discloses formations that are in parallel around the conduit (Figs. 2, 4) wherein the formations extend in the same direction and do not intersect.

26. Regarding claim **49**, Houston et al. discloses formations being in series around the circumference of the conduit (FIG. 2).

27. Regarding claim **50**, Houston et al. discloses formations that differ in height and/or the angle of the first and/or second faces by selecting ridges having various shapes or sizes (column 2, lines 3-5).

28. Regarding claim **51 and 52**, Houston et al. discloses formations differing in the angle of first faces and second faces wherein the ridging may taper in the direction of flow or in the opposite direction [0012].

29. Regarding claim **53**, Sano et al. teaches a member that is uniform along its length wherein the cross-sectional configuration does not vary along the length (Fig. 4).

30. Regarding claim **55**, Houston et al. disclose a conduit formed of a thermoplastic or a thermosetting plastic, i.e. polyetherurethane [0037].

Response to Arguments

31. Applicant's arguments filed 10 August 2011 have been fully considered but they are not persuasive. The Applicant contends that Houston et al. has no desire for different flow directions of fluid through tubing. The Applicant further contends that Houston et al. aims to reduce turbulence and that the asymmetric fin of Sano et al. creates a chaotic current, thereby teaching away from the combination. However, both Houston et al. and Sano et al. teach tubes having longitudinally extending members

therein that are used to reduce turbulence. Houston et al. discloses longitudinally extending members having a rectangular profile and Sano et al. teaches longitudinally extending members having a rectangular profile with an upward slope on one side that is used to further reduce flow resistance as the fluid flows toward the sloping side. Therefore, it would have obvious to have provided a sloped side, as taught by Sano et al. to the longitudinally extending members of Houston et al. to reduce the flow resistance of the fluid flowing in one direction. Flow resistance in the device of Sano et al. is reduced as the fluid flows toward the sloped sides from A to B (Fig. 11) and a chaotic current is created when the fluid flows from B to A. However, when using the device within a body as a stent, as disclosed by Houston et al., the fluid would only flow in one direction. Therefore, the chaotic current would not be established within the device of the combination of Houston et al. and Sano et al. The Applicant contends that Sano et al. requires a higher helix angle than considered desirable in Houston et al. However, the combination of Houston et al. and Sano et al. was made using the teaching of the single sloped side that produces a decrease in flow resistance. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOCELIN TANNER whose telephone number is (571)270-5202. The examiner can normally be reached on Monday through Thursday between 9am and 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Hughes can be reached on 571-272-4357. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

If there are any inquiries that are not being addressed by first contacting the Examiner or the Supervisor, you may send an email inquiry to TC3700_Workgroup_D_Inquiries@uspto.gov***.***

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jocelin C. Tanner/
11/01/2011
Examiner, Art Unit 3731

/Kathleen Sonnett/
Primary Examiner, Art Unit 3731